Network Technologies

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Network Technologies
Key R&T Issues (background issues)

Once aeronautical communications was at the forefront of communication and networking technology, sadly it is lagging behind the rest of the world, by holding on to standards that are being discarded by industry leading to lack of support, very high costs and poor communication standards.

The European Commission made a statement in support of IPv6 on the 29th of January 2002 as a major driver for economical growth and competition in Europe

IPv6 is “the” emerging global network technology

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Key R&T Issues

I-CNS 2002

- Identify key research and technology issues of both near-term (now to 2010) and far-term (beyond 2010) impact.
  - How to accommodate emerging technologies
    - IPv6
    - Mobile IPv6
    - Topology (e.g. addressing)
    - Security
    - QoS
    - IP based wireless
  - Issues:
    - IPv6 ~ ATN/OSI
    - Investment by Industry
    - Costs – is it realistic to expect airlines to pay for this?
    - Availability
    - Maintainability
    - Sustainability
    - Scalability
    - Adaptability
    - Growth – changes and system updates
    - Migration
    - Air-Ground communication technologies
    - Standards: Maturity of Standards, Evolution of Standards, Standards Process
    - Managing Security in networks – security policies, threats, risk analysis, security authorities, politics relational to International Standards.

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Current Work

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- Identify known work being done to address R&T issues in the topical area being discussed, and organizations doing the work.
  - iPAX (ground infrastructure with IPv6 backbone)
  - SATS (Airborne Internet)
  - ARINC, SITA, Connexion, IP based satellite services
    - IP based ground infrastructure for VDL (ACARS, M2)
  - Boeing ATM architecture to accommodate IPv6
  - AEEC Project 664 (Grey Cover – IPv4, Drafting IPv6, Part 8 ~ specifically ATN over IP)
  - NASA/GRC research on ATN harmonization TCP/IP
  - IPSky Project (completed 2001)
  - AeroSAPIENT (ATN over IP)
  - ICAO ATNP working on ATN ability to tunnel through IPv4
  - 3GPP (UMTS) Mandate IPv6
  - FAA FTI accommodates IP services

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Unaddressed Issues

- Identify issues not being addressed by any known R&T effort, as well as areas where current work is inadequate or under funded.
  - Accommodation Issues - Refer to page 2
    - Address need for roadmap or guidelines in relation to the accommodation of new and emerging technologies
  - Aviation Policy / Standards Cycle
    - How will global interoperability issues be addressed?

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Recommended Approach

- Recommend approaches to address the key R&T needs, organizations which might address these needs, needed collaborations or cooperative efforts, etc.
  - The creation of a Aviation Taskforce similar to iPAX Task Force
    - Foster NASA & FAA relationship with Eurocontrol on Aviation based IP
    - Define interoperability requirements based on IPv6
  - Increase NASA funding in areas of emerging and new network technologies
    - Initiate research to develop an architecture (e.g, Gateway) to accommodate IPv6 into the existing ATM communications infrastructure
  - NASA to place emerging technology issue into REDAC for recommendation.